



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/804,795

03/19/2004

Mark S. Isenberger

110348-135996

8881

31817

7590

09/20/2005

SCHWABE, WILLIAMSON & WYATT  
PACWEST CENTER, SUITES 1600-1900  
1211 S.W. FIFTH AVE.  
PORTLAND, OR 97204

EXAMINER

VU, HUNG K

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/804,795

Applicant(s)

ISENBERGER ET AL.

Examiner

Hung Vu

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 June 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-9, 11 and 13-43 is/are pending in the application.
- 4a) Of the above claim(s) 13-25 and 29-31 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-9, 11 and 26-28 is/are allowed.
- 6) ☒ Claim(s) 32-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Objections*

1. Claim 35 is objected to because of the following informalities: In claim 35, line 3, the phrase "at a second electrode surface" should be changed to "at the second electrode surface" for clarity. Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 32-34 and 37-43 are rejected under 35 U.S.C. 102(b) as being anticipated by Kim et al. (US 2002/0196653).

Kim et al. discloses, as shown in Figures 20-24, an integrated circuit, comprising:

a first electrode (151) formed on a support surface (73), the first electrode having a first electrode surface that intersects the support surface and a second electrode surface that is substantially parallel to the support surface;

a spacer (153a) positioned on the support surface adjacent to the first electrode surface, the spacer having a first spacer surface that is substantially parallel to the support surface and includes a transition point, wherein the spacer is positioned to create a separation distance between the first electrode and the transition point, such that the first spacer is substantially in a same plane as the second electrode surface;

a ferroelectric layer (155) formed on the first electrode and the spacer.

Regarding claim 33, Kim et al. discloses the circuit further comprises a second electrode (157) formed on the ferroelectric layer opposite of the first electrode.

Regarding claim 34, Kim et al. discloses the spacers are in contact with the first electrode surface.

Regarding claim 37, Kim et al. discloses the integrated circuit is a memory circuit.

Regarding claim 38, Kim et al. discloses the integrated circuit is a non-volatile memory circuit.

Regarding claim 39, Kim et al. discloses the second electrode adaptedly formed on the ferroelectric layer opposite the first electrode to form a memory cell.

Regarding claim 40, Kim et al. discloses, as shown in Figures 20-24, an integrated circuit, comprising:

at least two first electrodes (151), wherein the first electrodes are formed on a support surface (73), the first electrodes having first electrode surfaces that intersect the support surface;

a gap region between the first electrode surfaces;

a spacer (153a) on the support surface in the gap region, wherein the gap region is substantially occupied by the spacer;

Art Unit: 2811

a ferroelectric layer (155) formed on the first electrodes and the spacer.

Regarding claim 41, Kim et al. discloses the circuit further comprises second electrodes (portions 157) formed on the ferroelectric layer opposite each of the first electrodes.

Regarding claim 42, Kim et al. discloses portions of the spacer nearest to the first electrode surfaces have a height about equal to a height of the first electrodes, the height of the first electrodes being a distance between the support surface and second electrode surfaces of the first electrodes, the second electrode surfaces being substantially parallel to the support surface.

Regarding claim 43, Kim et al. discloses the second electrodes adaptedly formed on the ferroelectric layer opposite the first electrodes to form memory cells.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (US 202/0196653) in view of Fukuda et al. (PN 6,150,183, of record).

Kim et al. discloses the claimed invention including the integrated circuit as explained in the rejection above. Kim et al. does not disclose the first electrode comprises first and second

Art Unit: 2811

portions, the first portion comprising a first material that is non-reactive to the ferroelectric layer and located at the second electrode surface of the first electrode, and the second portion comprising a second material that is more conductive than the first material and located between the first portion and the support surface. However, Fukuda et al. discloses an integrated circuit comprising a first electrode comprises first and second portions (38,39), the first portion (38) comprising a first material (Pt) that is non-reactive to a ferroelectric layer (40) and located at the second electrode surface of the first electrode, and the second portion (39) comprising a second material (TiN, TaN) that is more conductive than the first material and located between the first portion and the support surface. Note Figure 19 of Fukuda et al.. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the first electrode of Kim et al. comprising first and second portions, the first portion comprising a first material that is non-reactive to the ferroelectric layer and located at the second electrode surface of the first electrode, and the second portion comprising a second material that is more conductive than the first material and located between the first portion and the support surface, such as taught by Fukuda et al. in order to suppress the oxidation of the undercoat metal layer.

Regarding claim 36, Kim et al. and Fukuda et al. disclose the spacer is formed against the first electrode surface such that the spacer isolates the second portion from the ferroelectric layer.

*Allowable Subject Matter*

4. Claims 2-9, 11 and 26-28 are allowed.

*Response to Arguments*

5. Applicant's arguments with respect to claims 32-43 are have been considered but are moot in view of the new ground(s) of rejection.

*Conclusion*

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung K. Vu whose telephone number is (571) 272-1666. The examiner can normally be reached on Tuesday-Friday 6:00-4:30, Eastern Time.

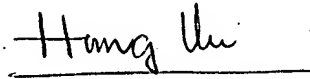
Art Unit: 2811

If attempts to reach the examiner by telephone are unsuccessful, the examiner's acting supervisor, Steven Loke can be reached on (571) 272-1657. The Central Fax Number for the organization where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Vu

September 15, 2005

A handwritten signature in cursive script, appearing to read "Hung Vu", is written over a horizontal line.

Hung Vu

Primary Examiner